9 February 1984

Dr. Oswald H. Ganley
Executive Director
Program on Information Resources Policy
Harvard University
200 Aiken
Cambridge, Massachusetts 02138

Dear Ossie,

In response to your letter and enclosure of February 1st, a few quick personal thoughts.

My primary reaction to the proposed study plan is that it is much too ambitious, and covers a far broader subject matter than can be constructively handled -- in that it deals not only with much of the entire spectrum of US-Japanese relations, but journeys as well into difficult domestic US questions. I would think that a study of these proportions would require a team of researchers and considerble time and money. If that is not feasible, and if the project is to remain basically the work of one person, then you might wish to have it focus on some particularly salient aspect or so of the present broad proposal.

Some for instance suggestions: growing bilateral trade frictions, as they apply to the softwear world; or, problems of national security and privacy associated with the growth of global data transfer networks; or, problems involved in halting the flow of softwear technology to unwanted recipients.

Sincerely,

Harold P. Ford

MEMORANDUM FOR:

HAL,

Attached is the suggested response you requested; Congratulations for your promotion to DCI.

Sid

Date 9 Feb. 1984

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The proposed Green study of US-Japanese computer software technology transfer issues raises some particularly interesting and current policy topics. I do, however, have severe misgivings with Green's Study Plan mainly because it tries to cover too much. The major issues and questions raised in the Plan deal with the entire spectrum of US-Japanese relations. It also includes an assessment of such sweeping problems as controls on scientific expression in the United States and the most effective means of allocating US financial and human resources in the computer software field. Finally, in the research method section Mr. Green throws three major European countries into the project. I have a hard time imagining a study that can effectively interweave all these intricate topics.

I think nonetheless that a study focusing on a particular aspect of the topic could provide a fascinating story for the policymakers. Such issues might include the growing bilateral trade frictions (they are already evident because of Tokyo's recent moves to protect its foundering software industry from foreign competition), the national security and privacy problems associated with the growth of global data transfer networks, and the problems of halting the flow of software technology to the USSR.

Program on Information Resources Policy

Anthony G. Oettinger
John C. LeGates
John F. McLaughlin
Benjamin M. Compaine
Oswald H. Ganley

February 1, 1984

Mr. Harold P. Ford
The Director of Central Intelligence
National Intelligence Council
Washington, D.C. 20505

Dear Hal:

Attached is a proposed study plan "Computer Software Technology Transfer Between the United States and Japan -- Issues and Implications for Policy" by Anthony Green, on loan to us from the National Security Agency for this year.

The transfer of computer technology between the United States and Japan is a subject that is getting increasing attention and raises policy issues and questions affecting private and public sector interests. I'd be grateful for your personal comments on Mr. Green's proposed study plan. Especially does the proposal address the major issues and questions? Your frank critique and suggestions will be greatly appreciated.

If at all possible, I would like to have your comments by February 22, 1984.

Sincerely,

Ossie

Oswald H. Ganley
Executive Director

OHG:cms

Attachment

Harvard University
Center for Information Policy Research
Harvard University
200 Aiken
Cambridge, Massachusetts 02138
617-495-4114

Study Plan

Computer Software Technology Transfer Between The United States and Japan--Issues and Implications for Policy

Anthony T. Green

January 1984

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BACKGROUND

The United States and more recently Japan both have been generally successful in research, development, marketing, and distribution of high technology products. But success has been accompanied by some significant issues over high technology transfer between the two nations. These issues involve critical stakes for both Japan and the United States in four key areas: domestic and international economic viability, national security, foreign policy, and the advancement of science and technology in an open society. It is important to emphasize that these four areas overlap considerably. Furthermore, the issues and stakes don't necessarily have the same importance in both countries.

1. Economic Viability. Secretary of State Shultz highlighted the importance of U.S.-Japanese economic relationships by citing the following statistics in a recent speech:

> . Japan took about 10% of our total exports last year, a larger share by far than any country except Canada;
> . We bought 25% of Japan's total export;
> . In 1976 our two-way trade already was a whopping $27 billion, but in 1983 it is expected to exceed $60 billion, more than double what it was 7 years ago and more than triple what it was 10 years ago;
> . Our combined gross national product (GNP) now accounts for about 35% of the total GNP of the World.

All is not well in the economic sector however. While it is commonly understood that import of U.S. technology is partly responsible for Japan's present economic success, on the

international economic balance sheet the U.S. has a large foreign trade deficit with Japan. This foreign trade issue was emphasized in President Reagan's November 1983 trip to Japan. In a television interview on the eve of his departure, Mr. Reagan referred to the "dangerous imbalance" in trade with Japan, currently running at about twenty billion dollars in the Japanese favor.[2] Approximately five billion dollars of the deficit is in the electronics industries.[3]

2. National Security. The Soviet Union has made major efforts to acquire high technology from the West (including Japan). Secretary of Defense Weinberger, in a Wall Street Journal article in January 1982, pointed out that "the Soviets have organized a massive, systematic effort to get advanced technology from the West. The purpose is to support the Soviet military buildup."[4] He went on to say that President Reagan had appealed to our allies in 1981 to help control the flow of technology to the Soviet Union. Secretary Weinberger stated that the United States would be working with COCOM (a coordinating committee consisting of NATO countries, less Iceland, plus Japan) early in 1982 in the first broad reconsideration of the Western technology control system in nearly 30 years. Secretary Weinberger appealed for the support of U.S. businessmen in recognizing that "the long term interests in peace and security they share with their stockholders far outweigh the short term

gains which the sales of certain equipment offer"[5] if such sales should provide technology that can be used for military purposes by the Soviet bloc. Implicit in Secretary Weinberger's appeal is the fact that control over the flow of technology to the Soviets requires not only U.S. businessmen to share this long term national security interest, but to be effective, Japan and other allied countries must also share this view.

3. Foreign Policy. While there have been notable shifts in Soviet trade policy during the past twenty years, it is important to keep this trade in perspective. In terms of world-wide high technology trade, the Soviets account for only a small percentage of total exports and imports. But, during the peak of detente with the Soviet Union there was an increase in the percentage of trade that included high technology industries. "The Export Administration Act of 1969 openly encouraged trade with all nations, including Communist countries. The result was a substantial increase in U.S.-Soviet trade, much of it involving dual use technology, such as computer hardware."[6] However, with the Soviet invasion of Afghanistan and further deterioration of detente, President Carter imposed a freeze on technology transfers to the Soviet Union.

The success of this effort to stem the flow of technology to the Soviet Union, as well as the subsequent embargos by President Reagan following the 1982 imposition of martial law in

Poland, clearly required understanding and cooperation by Japan and other COCOM allies of the U.S.

4. The Advancement of Science and Technology. In December 1982, reflecting the events in Afghanistan and Poland, President Reagan announced:

> U.S.-Soviet agreements coming up for renewal in the near future, including the agreements on energy and science and technology, will not be renewed. There will be a complete review of all other U.S.-Soviet exchange agreements.[7]

This signaled a further tightening of controls on the flow of science and technology information to prevent it from aiding the Soviet military. However these controls on scientific expression were of great concern to the scientific and academic community. The perspective of the community was summarized in the letter accompanying the Corson Report by Frank Press, President of the National Academy of Sciences.

> Scientific communication and National Security addresses one of the most difficult of policy issues: one in which fundamental national objectives seem to have been abruptly thrown into direct conflict. Advances in science and technology have traditionally thrived in an atmosphere of open communication; openness has contributed to American military and economic strength and has been a tenet of American culture and higher education. However, recent trends, including apparent increases in acquisition efforts by our adversaries, have raised serious concerns that openness may harm U.S. security by providing adversaries with military relevant technologies that can be directed against us.[8]

RESEARCH OBJECTIVES

One of the common threads through the areas described above is the high value placed on the possession of the

technology necessary to achieve national and economic objectives. The transfer of that technology from one company to another domestically and/or from one country to another is of major importance.

The purpose of this research is to investigate the transfer of one of the critical high technologies between the U.S. and Japan--computer technology. The primary emphasis will be on computer software. (This investigation will not focus on cryptographic technologies and software, which has previously been the subject of considerable research and debate). The objective will be to develop implications from an investigation of U.S.-Japanese computer software technology transfer that may provide insight for possible policy options for the United States. (in what)

Advances in computer hardware technology have increased the speed of computation and reduced the cost of storage of data. While there have been important advances in software, the high cost of developing and maintaining software is of increasing concern to manufacturers and users of computers. Another indication of the importance of software is its contribution to achieving economic goals thru the sale of computers. In 1982, computer sales was a $16.5 billion business for the United States and a $7 billion business for Japan.[9] But, "a lack of application software is supposed to be the greatest impediment for a further expansion of the market share of the Japanese

computer manufacturers" according to H. J. Welke in his report on data processing in Japan.[10] The Japanese Institute for New Generation Computer Technology (ICOT) takes the same view of the importance of software:

> In Japan, the lack of research is particularly noticeable in terms of software and basic theories which therefore deserve special attention (in Japan's Fifth Generation Computer Project). This aspect is extremely important, because development of hardware technologies, including computer architectures and VLSIs has to advance under guidance from research and development of software and basic theories.[11]

ISSUES THAT HAVE BEEN RAISED AND QUESTIONS TO BE ADDRESSED

A review of the literature suggests some major issues regarding technology transfer in general and/or U.S.-Japan computer software technology transfer in particular. The issues and questions relevant to each are as follows:

Issue 1. Whether the United States needs a new balance among its economic, national security, science and technology, and foreign policies affecting technology transfer. These policy areas not only overlap, their implementation has resulted in a complex web of interrelationships. A change in one policy can affect one or more of the relationships, with possible negative consequences as the following example illustrates.

Since the end of World War II United States foreign policy objectives have fostered a Japan with democratic institutions and the growth of a strong Japanese economy by, among other things, maintaining a relatively open U.S. market and

permitting access to U.S. technological advances. While policies for achieving these objectives can be considered a success in terms of the Japanese alliance with the West and the healthy Japanese economy, there are political and business leaders in the U.S. who see a need for a change in policy by either Japan or the United States. Some focus on the growing trade deficit with Japan. Some cite declining U.S. competitiveness in industries which they feel the Japanese have "targeted" as a rationale for a change in policy. For example, William C. Norris, Chairman of the Board of Control Data Corporation has said that "the United States Government has yet to deal effectively with Japan to obtain an equitable trade arrangement." One action Mr. Norris feels may be necessary is "to place controls on Japan's access to our advanced technology."[12] Some observers in the U.S. and Japan fear a series of U.S. and Japanese protective and counterprotective policies that might reduce the trade deficit, but at the expense of good will and trade that Japan considers vital to its economy. These observers caution that the U.S. carefully consider whether there is a need for change in policy and also fully understand what the consequences might be on other policies and relationships.

In addition to the relationship between economic and foreign policy issues like the above example, there are other critical interrelationships involving national security and the communication of scientific and technical information.

Technology transfer to the Soviet bloc and China and the sharing of defense technologies between the U.S. and Japan are both caught up in this web of interrelationships. For example, regarding the interrelationship between national security and economic issues, J. Fred Bucy, President of Texas Instruments Inc. and the Chairman of the Task Force on Export of U. S. Technology that produced the 1976 report "An Analysis of Export Control of U.S. Technology--a DOD Perspective," cautioned in his 1981 reappraisal of the issues:

> With the United States experiencing a trade deficit of over $30 billion in 1979 and anticipating a $36 billion deficit in 1980, America cannot afford to overlook new export opportunities. At the same time, however, neither the United States nor its Western allies can afford to purchase new export markets at the price of diminished mutual security.[13]

Questions relating to Issue 1

a. Economic viability Do the U.S. and Japan share compatible objectives in economic competition? Are the rules of competition the same for each? Are Japan and the U.S. fair economic competitors? Who are the competitors and what are their stakes?

b. National Security How do the United States and Japan differ in their perception of world events in terms of national security? To what extent and in which areas is there cooperation with Japan in national security matters? Conversely, where is national security an issue?

c. Foreign policy To what extent is there interdependency between Japan and the United States? Is there

cooperation commensurate with this interdependency? Are technology transfer policy and actions in consonance with overall US-Japan relations? To what extent are relations with major Western European nations, the Soviet Union, or China factors?

d. Advancement of science and technology To what extent is technology transfer a factor in U.S. and Japanese computer advancement? What are the important computer systems and application software technologies? What is the status of these technologies and the prospects for innovation and development in either the U.S. or Japan? What will be the effect of the IBM-Hitachi confrontation and settlement as well as other cases of alleged industrial espionage? What might be the effect of the computer software rights bill that the Japanese Government is proposing? What is the significance of the Japanese fifth generation computer project?

Issue 2. Whether the U.S. Government and business community are effectively organized (institutionally and in terms of policy) to deal with computer software technology transfer with Japan, now and in light of possible future events. Some U.S. business leaders, Government officials, and members of the academic and scientific communities see the U.S. as too fractionated institutionally and/or in need of policy changes to deal effectively with such matters as high technology economic competition with Japan or controls on transfer of technology. Others see better management in both Government and business within existing institutions and policy guidelines as the answer

to the challenges the U.S. faces. Proposed solutions to these matters range from laissez faire Governmental policy and/or voluntary business cooperative arrangements to formulation of a cabinet level Department of International Trade, as proposed by the Reagan administration. The implications of the present issues and the proposed solutions have brought into conflict liberal and conservative, political and economic, and other interests that transcend technology transfer per se.

Questions relating to Issue 2

a. Will existing policy and regulations suffice? If not, where are changes needed? Are case by case decisions required on proposed transfers of technology?

b. Is the U.S. Government and business community effectively allocating resources (financial and talent) to advance computer software technology and to implement technology transfer policy?

RESEARCH METHOD

Research will be conducted to validate and investigate the issues and address the questions described above. In addition to further literature research, interviews are planned with individuals familiar with various aspects of the problem, the stakes, the technology and possible policy options.

To provide additional perspective to this research, issues, questions, and findings regarding this subject as it relates to three major Western European nations, France, Great Britain, and West Germany will be highlighted and contrasted with findings regarding Japan and the U.S.

NOTES

1 Shultz, George. "Japan and America: International Partnership for the 1980s," Speech of Sept. 2, 1983. Washington: U.S. Dept. of State, Bureau of Public Affairs, (Current Policy no. 506), 1983.

2 New York Times, Nov. 9, 1983, section A, p.3, "President Begins 7-Day Trip to Asia."

3 Electronic Industries in Japan. Tokyo: Electronic Industries Association of Japan, 1983, adopted from pp.10-11.

4 Weinberger, Caspar W. "Technology Transfers to the Soviet Union," Wall Street Journal, Jan. 12, 1982, p. 22.

5 Ibid.

6 National Academy of Science. Panel on Scientific Communication and National Security. Committee on Science, Engineering and Public Policy. Scientific Communication and National Security. Washington: National Academy Press, 1982, p. 101.

7 Reagan, Ronald. "Announcement of Economic and Political Sanctions Against the Soviety Union," Dec. 29, 1982, Science, Vol. 215, no. 4533, Feb. 5, 1982, p. 637.

8 National Academy of Science, op. cit., see # 6, p.v.

9 Kirchner, Jake. "Computer Sales rising, But Slowly: EIA Study," Computerword, July 25, 1983, adapted from p.99 and, Electronic Industries in Japan. op.cit., see # 3, p.3.

10 Welke, J.H. Data Processing in Japan. Amsterdam: North-Holland Pub. Co., 1982, p. 121.

11 Outline of Research and Development Plans for Fifth Generation Computer Systems. Tokyo: Institute for New Generation Computer Technology (ICOT), May 1982, p. 21.

12 Norris, William C. "Business Forum; Limiting Japan's Access to Our Research," The New York Times, July 24, 1983, section 3, p. 3.

13 Bucy, Fred. "Technology Transfer and East-West Trade: A Reappraisal," International Security, Vol. 5, No. 3 Winter 1981 pp. 133.